No. 681,650. Patented Aug. 27, 1901.

J. E. COOPER.

ANTIFRICTION MECHANISM FOR AXLE SHAFTS OF RAILWAY CARRIAGES OR OTHER VEHICLES.

(Application filed Apr. 1, 1901.)

(No Model.) 4 Sheets—Sheet 1.

FIG. 1.

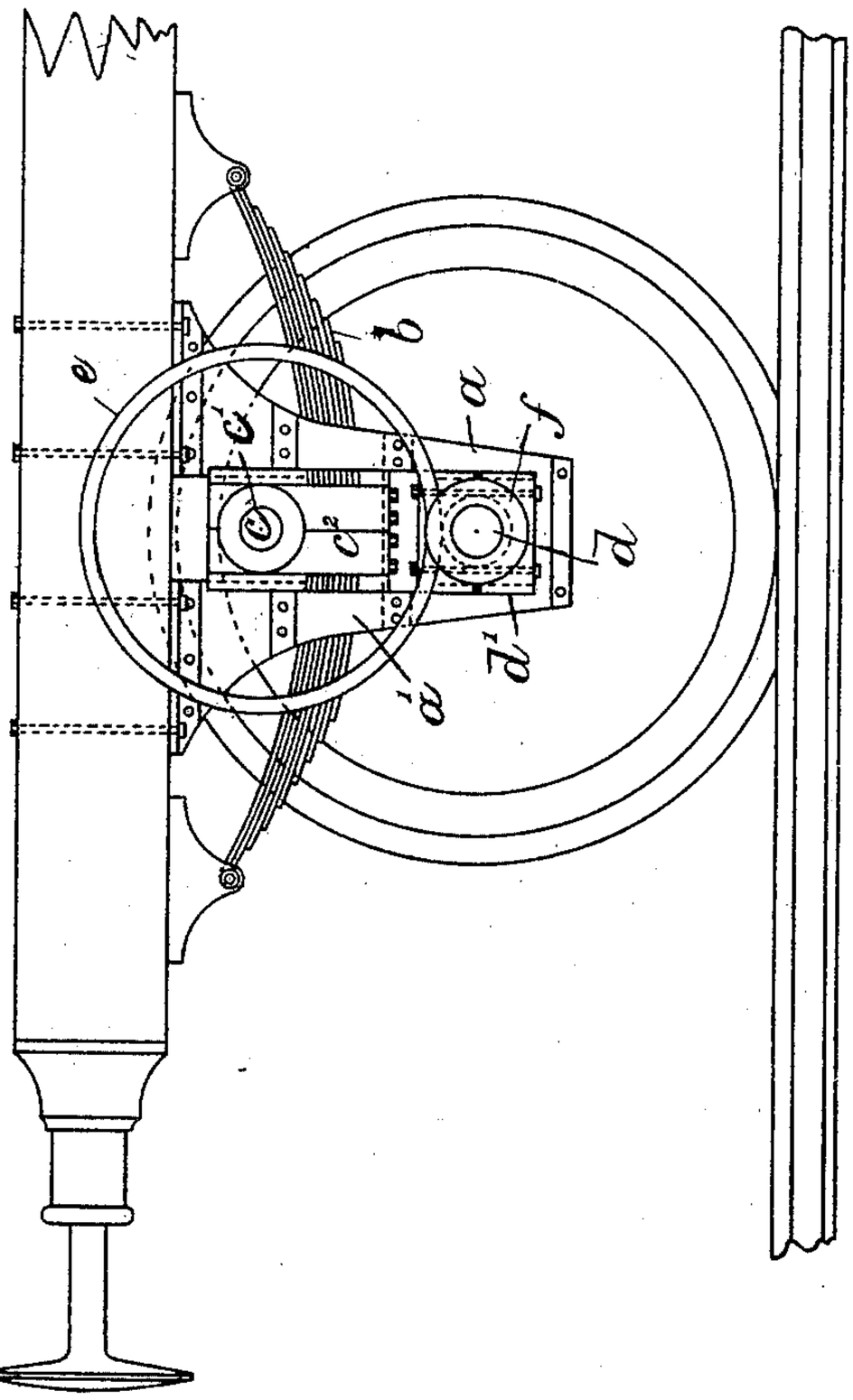
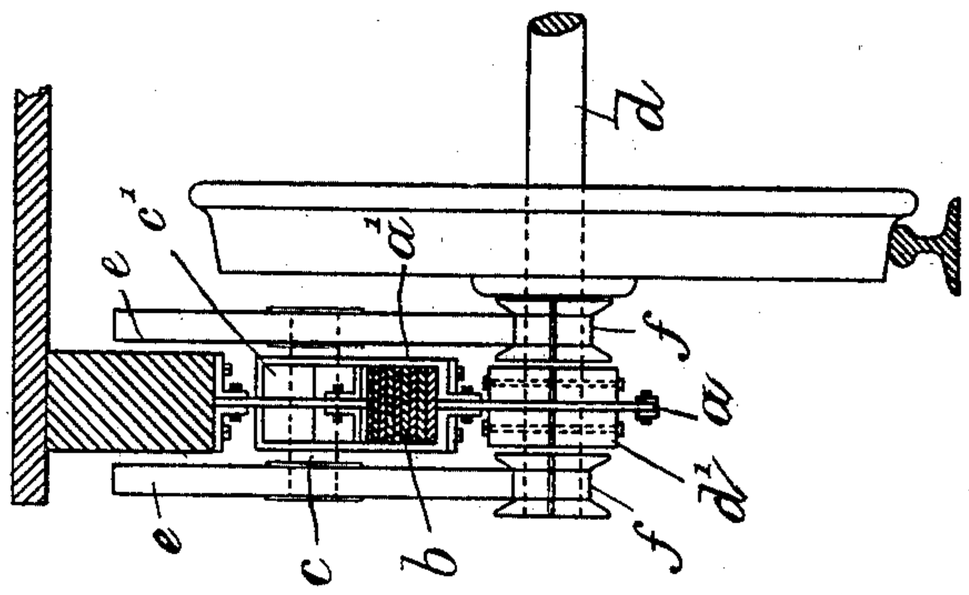


FIG. 2.



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(No Model.) (Application filed Apr. 1, 1901.) 4 Sheets—Sheet 2.

FIG. 3.

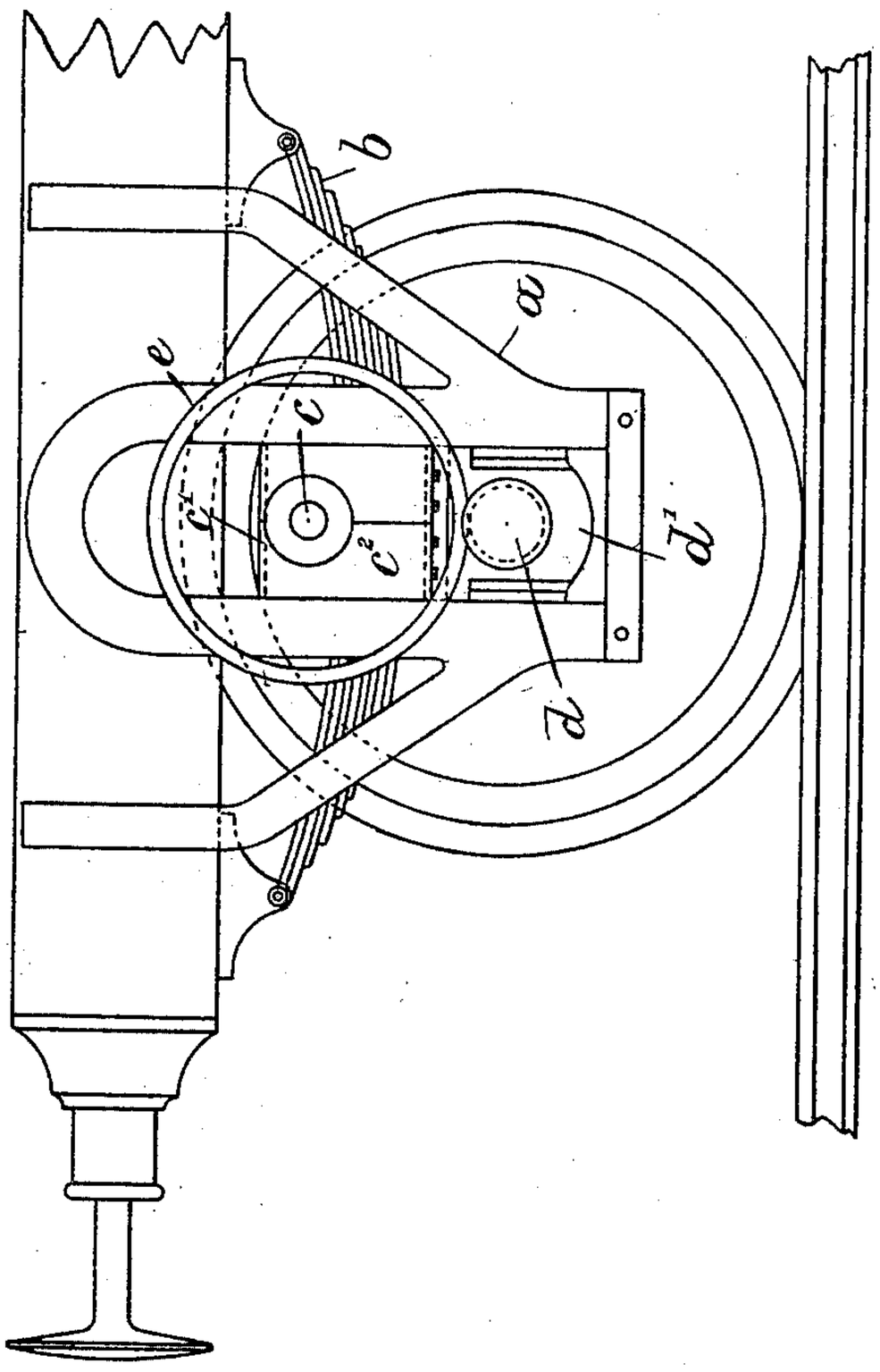

FIG. 4.

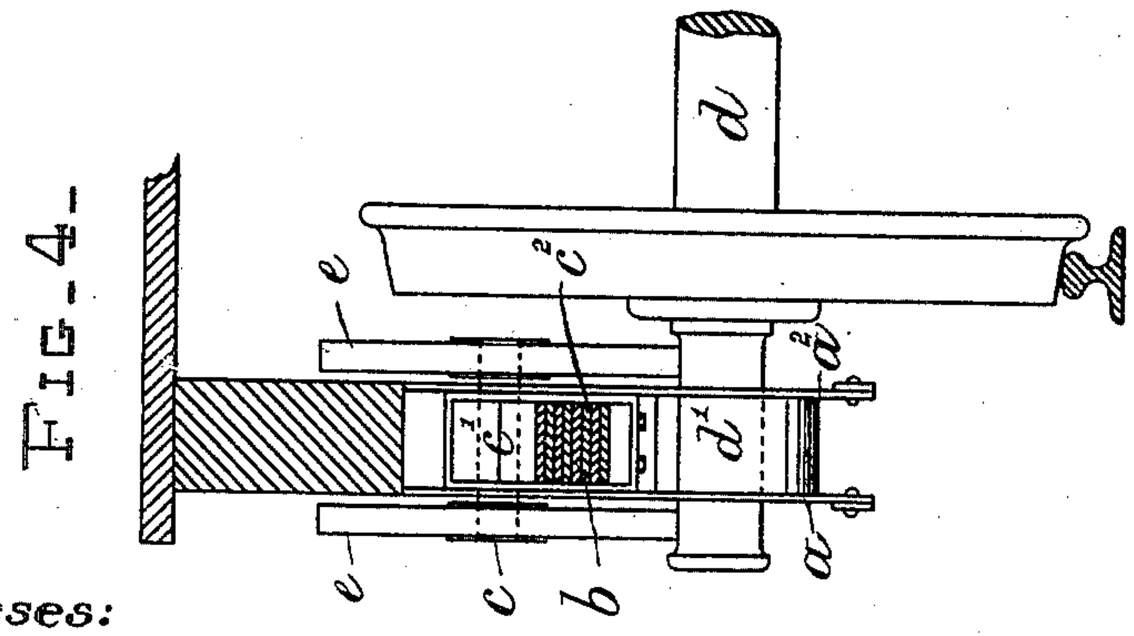

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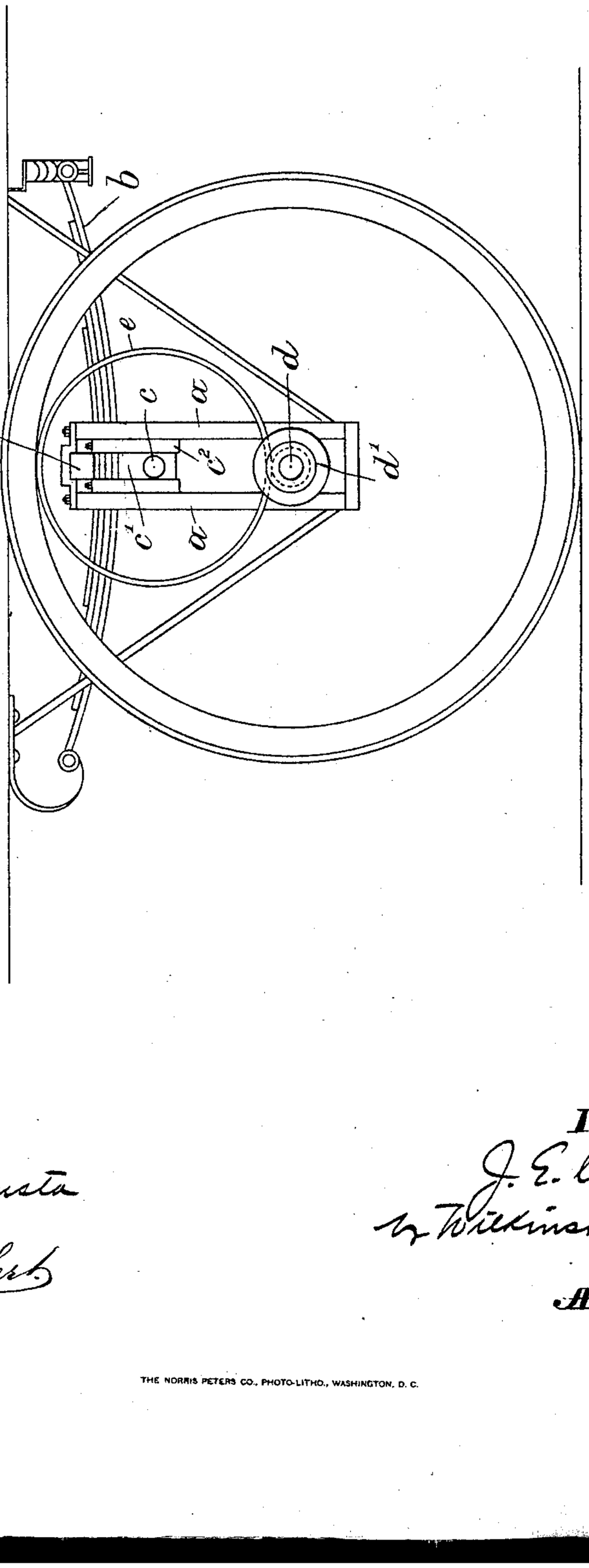
FIG. 5.



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(No Model.) 4 Sheets—Sheet 4.

FIG. 7.

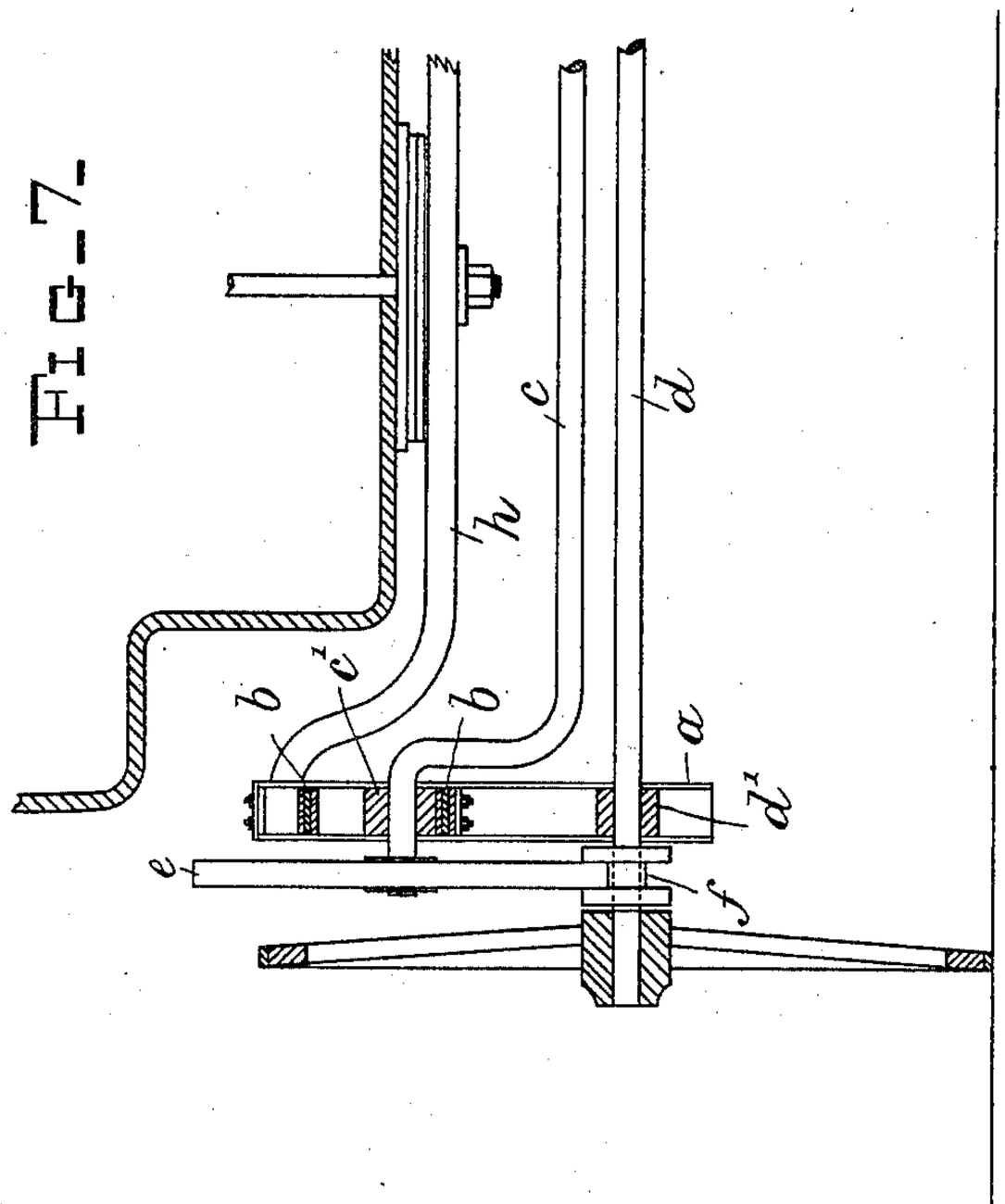
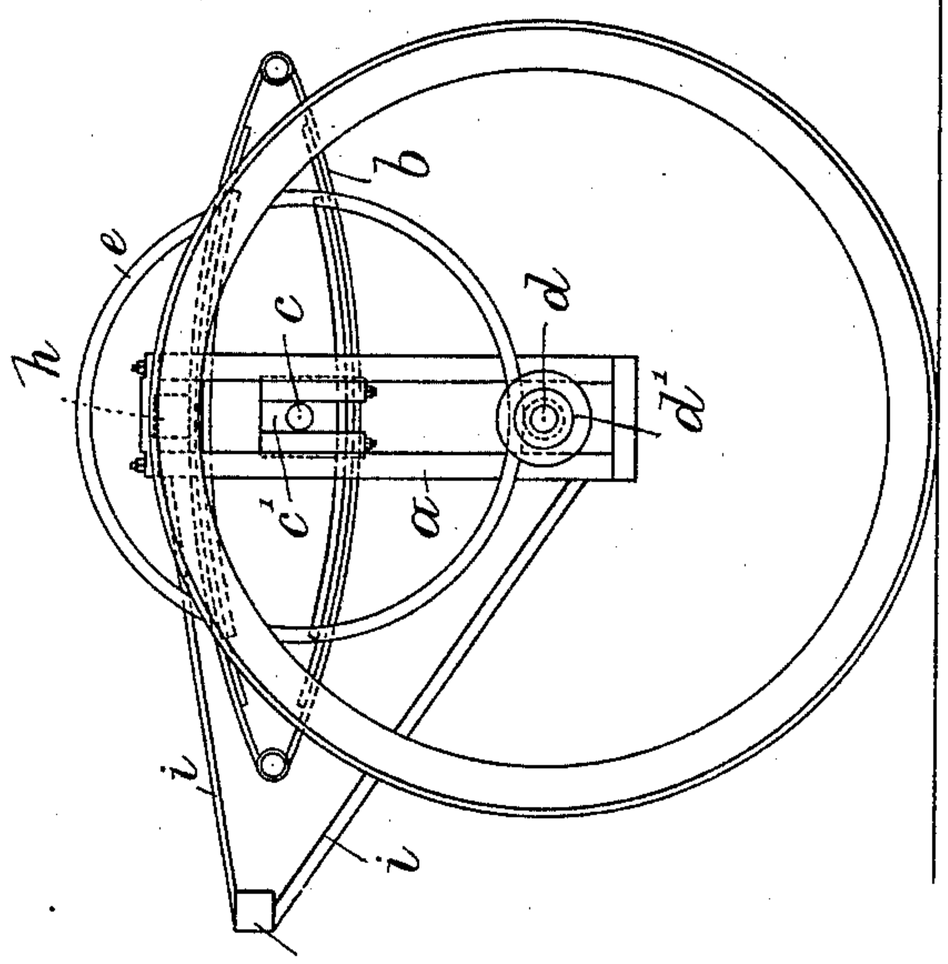


FIG. 8.



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UNITED STATES PATENT OFFICE.

JOHN EDWARD COOPER, OF WITHERNSEA, ENGLAND.

ANTIFRICTION MECHANISM FOR AXLE-SHAFTS OF RAILWAY-CARRIAGES OR OTHER VEHICLES.

SPECIFICATION forming part of Letters Patent No. 681,650, dated August 27, 1901.

Application filed April 1, 1901. Serial No. 53,867. (No model.)

To all whom it may concern:

Be it known that I, JOHN EDWARD COOPER, a subject of the King of Great Britain and Ireland, residing at Withernsea, in the county of York, England, have invented certain new and useful Improvements in Connection with the Antifriction Mechanism of the Axle-Shafts of Railway-Carriages or other Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to antifriction mechanism as applied to the axle-shafts of carriages or vehicles in the manner described and illustrated in the specification of Letters Patent No. 621,483, bearing date the 21st of March, 1899, this invention being an improvement upon the device of that patent.

According to my invention provision is made for combining with such antifriction mechanism the usual or other suitably-devised forms of springs on which to mount the car or body of the vehicle, thereby reducing shocks and vibrations to a minimum, and thus attaining a more perfect result from the antifriction mechanism by which the transmission is facilitated of heavier loads with reference to the power required to draw or propel them, and the especial feature of improvement of my device is that the main axle and the antifriction-axle of the antifriction mechanism are maintained in a fixed relation to each other irrespective of the load-pressure, and to accomplish this end I secure a spring of the vehicle directly to the upper journal-box and in the more specific example secure the journals together and both to the spring.

Having thus set forth the object and utility of this invention, I will now proceed to further explain the same with reference to the accompanying drawings, so that the nature thereof can be fully nnderstood and readily carried into effect.

In the drawings the same letters of reference indicate corresponding parts in all the figures.

Figure 1 illustrates in side elevation part of a railway-vehicle, showing the application of my invention to the existing rolling-stock, corresponding to which Fig. 2 is an end elevation, partly in section. Figs. 3 and 4 are similar views to Figs. 1 and 2, but showing a modified form of horn-plate duplicated. Fig. 5 illustrates a construction in which the spring is preferably mounted above the antifriction journal-box. Fig. 6 is a side elevation of the front wheel of an omnibus or the like vehicle embodying my improvements, corresponding to which Fig. 7 is a transverse sectional view.

Referring to Figs. 1 and 2, in applying the invention to railway-vehicles in a manner adapted to the existing rolling-stock I construct the horn-plate a in sections, the center section a' being so constructed that the spring b supporting the vehicle may pass through such horn-plate and be allowed to operate freely. The horn-plate is secured to the underframe of the car or truck, but the guide-boxes c' and d', with the axles c and d journaled therein, are free to slide up and down in the horn-plates a and share the movement of the spring b, and are thus free from shocks or jolts, which would be detrimental to the proper working of the antifriction mechanism, the top axle-box c' being bound to the spring b by clips c^2, which grip the same. In the case of railway-trucks as usually constructed the main axle d is carried out beyond the hub of the wheel and the antifriction mechanism is mounted above such extension of the main axle, so that the antifriction-wheels e e are in rolling contact with collars f f, fitted on the extended part of such main axle, such antifriction rollers or wheels being provided in duplicate, with the horn-plate a and spring b occupying the central position between them.

Referring to Figs. 3 and 4, if desirable the present horn-plate a may be used, in which case an additional horn-plate a^2 to correspond with the existing one would be required, and, if desirable, the antifriction mechanism e e may be applied direct to the main axle d without collars.

In Fig. 5 the horn-plate a is attached directly to the spring b itself, the connection being preferably above the antifriction journal-box c'. In this case the spring is only a single one, simply resting upon the journal-box and held to same by clips c^2 and bolts.

In the case of omnibuses and other vehicles, as shown in Figs. 6 and 7, the horn-plate guide-frame *a* is attached directly to the spring *b* itself, the connection being preferably above the journal-box *c'* of the antifriction-axle *c*. In order that the spring *b* may operate freely, it is necessary where the fore-carriage is formed by an iron bar *h* instead of a wooden frame and where the springs are of the kind shown that the lower side of the spring shall be connected or hung up, as it were, to the journal-box *c'* of the antifriction-wheel, as this is the only means whereby the spring while being allowed freely to expand when weight is placed in the vehicle can at the same time be connected with the axle *c*, whereon the antifriction-wheel is placed. The upper part of the spring is connected to the bent fore-carriage bar *h* by iron clips and bolts. It is also connected to the upper part of the horn-plate in like manner. When weight is placed in the vehicle, the iron cross-bars *h*, lying on the top side of the spring, presses the same downward, while the lower part of the spring, being fastened to the antifriction journal-box *c'*, working in the horn-plate, allows the spring to expand and contract freely. The iron stays *i* are merely connected to the wooden bar *j*, which is in front of the vehicle, instead of a wooden fore-carriage in order to keep the horn-plate in its proper position. The antifriction-axle *c* takes the form of a crank-axle to keep all clear of the body of the vehicle, the antifriction-disks *e e* being of course loose on the axle *c*, which is fast. Otherwise when the antifriction-axle *c* is straight the antifriction-disks *e e* may be fast and the axle be made use of as the driving-shaft of a motor for propelling the vehicle. For this purpose a first-motion shaft may be geared to the antifriction-wheel shaft and this again to the main axle, the gearing being adapted to reduce the speed of any motor which might be applied to drive the vehicle.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination in a vehicle-truck, of a horn-plate, guide-boxes rigidly secured together and playing in the horn-plate, friction-rollers having an axle journaled in one of the guide-boxes, the guide-boxes being subject to the action of the vehicle-spring.

2. The combination in a vehicle-truck, of a horn-plate, guide-boxes rigidly secured together and playing in the horn-plate, friction-rollers having an axle journaled in one of the guide-boxes, the guide-boxes being secured to the vehicle-spring.

3. In antifriction mechanism, the combination of a main axle and an antifriction-axle secured together so as to maintain a fixed relation, and both the journals secured to vehicle-springs, substantially as described.

4. In a vehicle or motor truck, the combination of a body, horn-plates having guide-slots secured to the body, two journal-boxes mounted in each horn-plate and playing in the guide-slots, the upper journal carrying the axle of a friction-disk, the lower journal carrying the main axle, and a spring secured to the body and directly to the upper journal-box.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN EDWARD COOPER.

Witnesses:
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